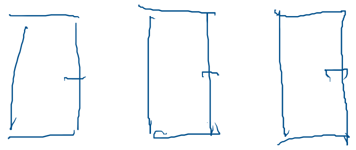
Erik 2024-07-26

Friday, July 26, 2024 4:56 PM

D.Ú. pravdepodobnosť záchytu v 2D
Stredný čas záchytu

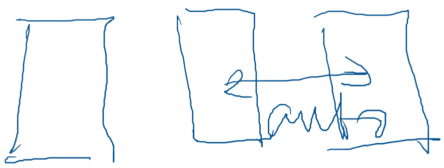
Monty Hall:



A B C

Vyberieš MH

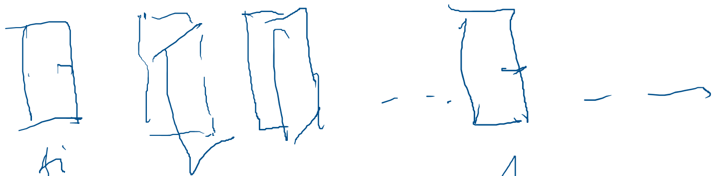
Ostať pri A alebo zmeniť na C,



A

				Nezm.	Zmením,
A	O	—	1/6	1	0
A	—	O	1/6	1	0
—	A	O	1/3	0	1
—	O	A	1/3	0	1
Výhra				1/3	2/3

100 dverí



1/100

$$99 \times \frac{1}{100} \longrightarrow \frac{99}{100}$$

2D varianta

stac. riešenie D.R. v 2D,

$$\Delta_r = \frac{1}{r}\frac{\partial}{\partial r} r \frac{\partial}{\partial r}$$

$$\Delta_r c = 0 \qquad \frac{1}{r}\cdot\frac{\partial}{\partial r} r \frac{\partial c}{\partial r} = 0$$

$$c(a) = 0, \quad c(c) = 0$$
$$c(b) = c_0 \quad \text{vo vš. časoch}$$

$$0 < a < r < c$$

Môžem násobiť r

$$\frac{\partial}{\partial r} r \frac{\partial c}{\partial r} = 0$$

$$r \frac{\partial c}{\partial r} = A$$

$$\frac{\partial c}{\partial r} = \frac{A}{r}$$

$$\partial c = \frac{A}{r}\partial r = A\,\partial \ln r$$

$$c(r) = \underline{A} \ln r + \underline{B}$$

a b c

$$a < r < b$$

$$c(a) = A \ln a + B = 0 \qquad B = -A \ln a$$

$$c = A \ln \frac{r}{a}$$

$$C = A \ln \frac{r}{a}$$

$$C(b) = C_0 \quad A \ln \frac{b}{a} = C_0$$

$$A = C_0 / \ln \frac{b}{a}$$

$$C_a(r) = C_0 \frac{\ln(r/a)}{\ln(b/a)} = C_0 \frac{\ln r - \ln a}{\ln b - \ln a}$$

$$b \le r \le c$$

$$C_c(r) = C_0 \frac{\ln c - \ln r}{\ln c - \ln b}$$

Difúzny tok

$$J = -D \frac{\partial C}{\partial r} =$$

a)

$$-D \frac{\partial}{\partial r} C_0 \frac{\ln(r/a)}{\ln(b/a)} =$$

$$= -D \frac{C_0}{\ln(b/a)} \frac{1}{r}$$

$$I_a = \left| 4\pi a^2 D \frac{1}{\ln(b/a)} \cdot \frac{1}{a} \right| =$$

$$= 4\pi D C_0 \frac{a}{\ln(b/a)}$$

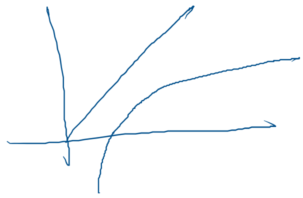
$$I_c = 4\pi D C_0 \frac{c}{\ln(c/b)} \to \infty \text{ keď } c \to \infty$$

Pravd. záchytu a:

$$P(a|b,c) = \frac{I_a}{I_a + I_c} =$$

$$= \frac{\dfrac{a}{\ln(b/a)}}{\dfrac{a}{\ln(b/a)} + \dfrac{c}{\ln(c/b)}} = \frac{1}{1 + \dfrac{c}{a}\,\dfrac{\ln\frac{b}{a}}{\ln\frac{c}{b}}} =$$

$$= \frac{a \ln\frac{c}{b}}{a \ln\frac{c}{b} + c \ln\frac{b}{a}} \xrightarrow[c\to\infty]{} 0$$

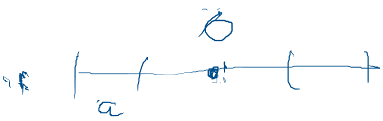


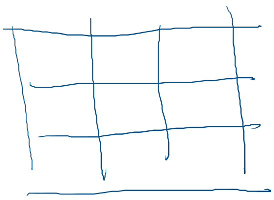
$x = e^{100}$

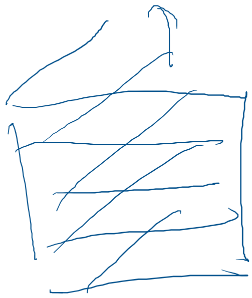
$\ln x = 100$

$c \to \infty$

$$\lim_{x\to\infty} \frac{x}{\ln x} \underset{\text{L'Hôpital}}{=} \lim_{x\to\infty} \frac{1}{1/x} = \lim_{x\to\infty} x = +\infty$$





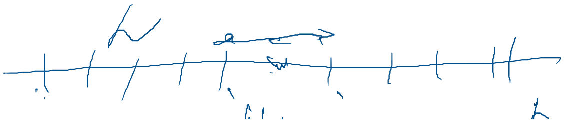


1D $\quad P(\text{navštívenia } 0) = 1$

2D $\quad$ — n —

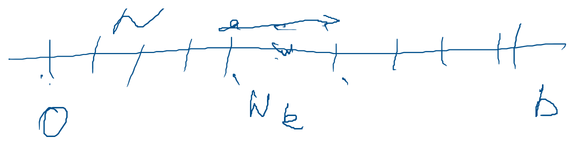
$\langle T \rangle = \infty$

3D $\quad$ — n — $\quad = 0.536$



$w_k, \; k = 0, 1, 2 \ldots N$

$h = \frac{b}{\;}$



[illegible] $= 0, 1, 2, \ldots, N$

$$N = \frac{b}{h}$$

w_k – str. čas príchodu do 0

$$w_k = \frac{1}{2} w_{k-1} + \frac{1}{2} w_{k+1} + \tau$$

$k \to x$

$k-1 \to x-h$

$k+1 \to x+h$

$$w(x) = \frac{1}{2} w(x-h) + \frac{1}{2} w(x+h) + \tau$$

$$0 = \frac{1}{2}\left(w(x-h) - w(x)\right) + \frac{1}{2}\left(w(x+h) - w(x)\right) + \tau \qquad / \times \frac{1}{h}$$

$$0 = \frac{1}{2} \frac{w(x+h) - w(x)}{h} - \frac{1}{2} \frac{w(x) - w(x-h)}{h} + \frac{\tau}{h}$$

$\xrightarrow{h \to 0} w'(x+h)$ $\qquad w'(x)$

$$0 = \frac{1}{2}\left(w'(x+h) - w'(x)\right) + \frac{\tau}{h} \to 0$$

$$\boxed{0 = w''(x) + \frac{2\tau}{h^2}}$$

1D na obl. $\langle 0, b \rangle$

a) 0 pri abs. hranica

b) 0 abs. b odrážajúca hr

a) 0, b abs. [illegible]

b) 0 abs, b odražajuća h.

$\Rightarrow$

P_k

$\rightarrow P_k = \frac{1}{2} P_{k-1} + \frac{1}{2} P_{k+1}$

$$\boxed{\Delta P = 0}$$

$P_k = p P_{k-1} + q P_{k+1} \quad | \quad p + q = 1$